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CORRELATES OF ALCOHOL AND MARIJUANA USE AMONG RURAL HIGH SCHOOL STUDENTS

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ABSTRACT

Data were collected from 492 high school students in an agriculturally based county in southwestern Ohio during the spring of 1979. Ninth and twelfth grade students from 6 participating high schools were interviewed at each of the schools on a group basis, at which time data concerning drug use and socio-demographic background variables were collected. The sample is composed of 47.5 percent of all ninth and twelfth grade students in the county, and over 73 percent of all eligible students from the six participating high schools were involved in the study. Data about frequency of marijuana and alcohol use were gathered and separate regression analyses conducted on the data set for each drug. The findings demonstrated that a majority of the students had used each of the drugs at least once in their life. Alcohol had been used at least once by 78.3 percent of the students, while 51.3 percent of the students had used marijuana at least once. Five of the independent variables used to predict drug use were shown to be significantly related to the two dependent variables. While the amount of explained variance for use of the two drugs was relatively low, the findings were quite consistent with the existing research literature.

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INTRODUCTION

Practically every major newspaper in the continental U.S. has printed many articles about drug abuse in recent years, and numerous television programs have made direct and indirect references to the drug abuse problem. Local community groups have organized educational programs to inform parents and children about the horrors of drug abuse in hopes that the incidence of illegal drug use will be reduced. These activities are symptomatic of the concern that exists among many segments of the society relative to the drug abuse problem which emerged during the 1960's, and expanded rapidly during the early 1970's.

While some people suggest that certain types of drug abuse will begin to wane in terms of use (McGlothlin, 1974), others suggest that drug abuse has leveled off, but will probably not decline (National Commission on Marijuana and Drug Abuse, 1972: 264-265). Still others suggest that drug abuse has not yet peaked in terms of use rates and will probably become a permanent part of the U.S. culture (Josephson, 1974: 178). The latter position appears to have the greatest validity since research has demonstrated that illegal drug use has tended to increase for certain age cohorts, such as youth and young adults (San Mateo County Department of Public Health and Welfare, 1973; Groves, 1974: 252; Blum, 1969; Abelson, et al, 1973; National Commission on Marijuana and Drug Abuse, 2nd Report, 1973: 83; Gallop Poll, 1969; Solomon, 1968).

While an extensive research literature exists which has documented the rapid increases in substance abuse in metropolitan areas, very little information has been generated about the nature and scope of drug use in

nonmetropolitan areas. The research conducted to date among nonmetropolitan populations tends to show that rural people have a much lower incidence of drug abuse than metropolitan groups (Forslund, 1977-78; Heiligman, 1973; Tolone and Dermott, 1975; Fischler, 1975-76; National Commission on Marijuana and Drug Abuse, 1972: 32, and 1973: 66-67) but the evidence is sufficient to demonstrate that substance abuse is no longer confined to metropolitan communities.

The purpose of this paper is to report the findings of a study designed to assess the incidence of alcohol and marijuana abuse among rural high school students and to investigate the correlates of such drug use. The drugs selected for investigation were chosen because they are the drugs most often abused by high school students (National Commission on Marijuana and Drug Abuse, 1973: 82) and have been shown to be the drugs most frequently used in the antecedent stages of more extensive drug involvement (Kandel, 1975; Kandel and Faust, 1975). Research such as this should contribute to the formation of programs to ameliorate alcohol and marijuana abuse in rural high schools, and in so doing, should reduce the probability that young people will progress to more advanced stages of drug abuse (i.e., multiple drug use and narcotic addiction).

CORRELATES OF ALCOHOL AND MARIJUANA ABUSE

The existing drug abuse research literature indicates that several factors have consistently been demonstrated to be significantly correlated with alcohol and marijuana use among students.[2] The factors are: age (Josephson, 1974; Blum, 1969; National Commission on Marijuana and Drug

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[2] Since the research was focused upon high school students, literature about college students was not included in this paper.

Abuse, 2nd Report, 1973; National Commission on Marijuana and Drug Abuse, 1st Report, 1972; McKee and Robertson, 1975), sex (Pittel, 1973; Josephson, 1974; Lombrillo and Hain, 1972; McKee and Robertson, 1975; Judd, et al, 1973; Solomon, 1968; Blum, 1969; National Commission on Marijuana and Drug Abuse, 2nd Report, 1973; National Commission on Marijuana and Drug Abuse, 1st Report, 1972), socio-economic status (Ianni, 1973; Josephson, 1974; Kandel, et al, 1976; Patch, 1973; National Commission on Marijuana and Drug Abuse, 2nd Report, 1973; National Commission on Marijuana and Drug Abuse, 1st Report, 1972), stability of home-life (Johnson, et al, 1972; Kandel, et al, 1976; Forslund, 1977-78; Tolone and Dermott, 1975; National Commission on Marijuana and Drug Abuse, 2nd Report, 1973; National Commission on Marijuana and Drug Abuse, 1st Report, 1972; Judd, et al, 1973), academic performance (Patch, 1973; Fischler, 1975-76; Kandel, et al, 1976; Forslund, 1977-78), and personal crisis (Gove, et al, 1979; Brotman and Suffet, 1973; Judd, et al, 1973).

While consensus does not exist relative to the relationship of each of the above-mentioned variables and the incidence of alcohol and marijuana use, certain associations tend to be reproduced. Some of the major trends are: 1) older youth tend to be more frequent users of alcohol and marijuana even though the drug use usually begins in the early teens; 2) males tend to be more frequent abusers of alcohol and marijuana than females even though the differences are being eroded over time; 3) young people from higher socio-economic family units tend to be the most frequent abusers of alcohol and marijuana;[3] 4) younsters from homes which are unstable due to

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[3]There appears to be general agreement in the existing research literature that drug abuse is no longer confined to lower socio-economic groups. The data suggest that drug abuse is found in all socio-economic classes.

stress between parents or severance of marriages tend to be more frequent abusers of alcohol and marijuana; 5) the highest academic achievers tend to be the most frequent abusers of alcohol and marijuana;[4] 6) youngsters that have experienced personal crisis tend to use alcohol and marijuana more frequently than students not encountering stress; and lastly, 7) research suggests that alcohol and marijuana abuse has been diffused among rural youth. Thus, the existing literature suggests that alcohol and marijuana use will be highest for older males from higher socio-ecomonic backgrounds who have experienced personal stress, are better students, and come from homes which are experiencing interpersonal conflict or have been fractured by separation, divorce or death.

RESEARCH METHODOLOGY

A research study was undertaken to determine if the national patterns discussed in the existing drug abuse literature were identifiable in rural Ohio. A county located in southwestern Ohio was selected for investigation because it is entirely rural by census definition and is located relatively close to a metropolitan area. All ninth and twelfth grade students within the county were defined as being eligible to participate in the study and school administrators were solicited to grant permission to conduct the study during regularly scheduled school hours. Only one administrator refused permission for the research to be conducted. Even though the school which did not participate in the study was one of the larger public high schools in the county, conversations with several informed people in the county suggest that the student body of the nonparticipating school was not significantly different from those included. Thus, nonparticipation of the school in the study should not significantly affect the generalizability of the findings to the county.

[4]This trend is not as consistent in the literature as the others discussed.

Four hundred ninety-two useable questionnaires were completed which constitute 47.5 percent of all ninth and twelfth grade students in the county at the time of the study. Over 73 percent of all eligible students from the six cooperating high schools[5] were represented in the sample. No attempt was made to involve students who were absent during the time when the questionnaires were administered, subsequently, persons absent during the group data collection sessions were not included in the study.

The data were collected in the spring of 1979 in large group sessions. The ninth and twelfth grade students at each high school were brought together in large groups and instructed by research staff persons how to complete the questionnaire. A research staff person remained in the presence of the study participants until all questionnaires were completed. No interaction was permitted among the study participants and no one other than the research staff gained access to any of the questionnaires. Complete anonymity was assured because no names were required on the questionnaire and the students placed their completed questionnaires in one of several envelopes on the monitor's desk. All of the students remained in the interviewing room until all questionnaires were completed, placed in the envelopes, and the containers sealed. These methods were used to prevent inflation or deflation of drug use due to peer pressure.

Operationalization of Variables

The explanatory factors derived from the literature and used in the study were operationalized in the following manner:

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[5]The six cooperating high schools are composed of one parochial, one vocational-technical, and four public schools. Cooperation from the administrators and teachers of these six schools was extremely good, which demonstrates the concern among high school teachers for the social well-being of their students.

Age was measured as years of age of the respondent at last birth date.

Sex was treated as a dummy variable, with males receiving a value of 0 and females a value of 1.

Socio-economic status was operationalized by asking the students to classify their family's income relative to other families in the community into one of the following categories: "very poor", "poor", "a little less than average", "about average", "a little more than average", "wealthy", and "very wealthy". The categories were weighted 1 through 7 with "very poor" receiving a value of 1 and "very wealthy" designated as 7.

Stability of home-life was measured by two variables termed "marital status" and "parental association". Marital status of parents was treated as a dummy variable with married equal to 1 and not married equal to 0. Parental association was operationalized by asking the students to rate how well their parents related to each other using the following categories: "very poorly", "somewhat below average", "somewhat above average", and "very well". The weighting values applied to the categories ranged from 1 through 5, with "very poorly" receiving a value of 1 and "very well" receiving a value of 5.

Academic performance was measured by asking the students to compare their academic performance with other students in school. The possible responses were: "much worse", "somewhat worse", "about average", "somewhat better", and "much better". The weighting values ranged from 1 for "much worse" to 5 for "much better".

Personal crisis was measured by providing the student with a list of significant personal situations such as serious physical problems, trouble in school, being fired from a job, psychological problems, or death in the immediate family, and asking them to note if they had ever experienced

any of the problems mentioned. Individuals who had not experienced any of the problems received a value of 1, while those persons who had experienced one or more of the problems received a value of 0.

The dependent variables in the study were measured in the following manner. Alcohol consumption was operationalized by asking the students to choose the category that best represented their alcohol use. The possible responses were: "almost every day", "several times a week", "a few times a month", "a few times a year", and "never used". The weighting values ranged from 5 for "almost every day" to 1 for "never used".

Marijuana use was measured by asking the students to select the response category that best represented their marijuana use. The possible responses were: "almost every day", "several times per month", "a few times per year", "only once or twice ever" and "never used". The weighting values ranged from 6 for "almost daily" to 1 for "never used".

Statistical Analyses

The data were analyzed using multiple correlation and step-wise regression analyses. The correlation analysis was used to assess the relevance of the stated research expectations, while the regression analyses were used to determine the relative explanatory power of the independent variables when considered simultaneously. It was assumed the measurement techniques used produced metric data, which permitted use of multi-variate parametric statistics. It was reasoned that measurement error would be more than compensated by the more powerful statistics used in the analyses (Abelson and Tukey, 1970; Labovitz, 1970). Missing data were assigned the variable mean and retained for further analyses.[6]

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[6] The amount of missing data was minuscule, therefore, restriction of the variables is insignificant. Subsequently, the amount of explained variance in the two regressions should not be affected.

FINDINGS

The study findings are presented in descriptive as well as multivariate form. The frequency of distribution of alcohol and marijuana use are presented in Table 1.

Table 1: Frequency Distributions of Marijuana and Alcohol Use (N=492)

Drug	Frequency of Use							
	Almost Daily	Several Times a Week	A Few Times a Month	A Few Times Per Year	Only Once or Twice Ever	Never Used	No Data	Mean Age of First Use
Alcohol	5.5	15.9	25.8	31.1	N.A.*	15.4	6.3	11.9
Marijuana	10.4	11.8	9.8	7.1	12.2	46.5	2.2	13.9

*This category was not used to assess alcohol use.

The data presented in Table 1 shows that a large majority of the student respondents had used alcohol at least a few times a year, and that half of the respondents had used marijuana at least once. These data demonstrate that the percentage of students who have used marijuana and alcohol at some time in their lives exceeds the national percentages published in the national drug abuse commission's report (1973:82). The national data indicate that 74 percent of the senior high students had used alcohol in 1972 and 40 percent had tried marijuana at least once.[7] The responses from the rural students in the study reported here indicated that 78.3 percent had used alcohol and 51.3 percent of the respondents had used marijuana. These data indicate that alcohol and marijuana use have not only been diffused to the study area, but widely adopted by the students studied.

[7]Inspection of the data sources used to compose the national data set used by the drug abuse commission will show that a large majority of the studies were conducted in urban areas.

Table 2: Correlates of Alcohol and Marijuana Use Among Rural Students (N=492)

	Age	Sex	Family Income	Parents' Marital Status	Parental Association	Academic Performance	Personal Crisis	Alcohol Use	Marijuana Use
Age	1.000								
Sex	-0.002	1.000							
Family Income	-0.003	0.077	1.000						
Parents' Marital Status	0.014	0.082	0.160*	1.000					
Parental Association	-0.046	-0.028	0.123*	0.115*	1.000				
Academic Performance	0.141*	0.080	0.068	0.070	0.072	1.000			
Personal Crisis	-0.045	0.104*	0.078	0.095*	0.125*	0.129*	1.000		
Alcohol Use	0.254*	-0.109*	-0.039	-0.096*	-0.169*	-0.082	-0.219*	1.000	
Marijuana Use	0.191*	-0.107*	-0.033	-0.149*	-0.144*	-0.066	-0.194*	0.550*	1.000

*Significant at the .05 level.

Each of the variables discussed in the methods section of this paper were correlated with frequency of alcohol and marijuana use. The correlation matrix is presented in Table 2.

The correlations findings show that the same independent variables were significantly related with alcohol and marijuana use. Age, sex, parents' marital status, parental association, and personal crisis were the factors significantly correlated with frequency of alcohol and marijuana use at the .05 level. While the magnitude of the correlations were very low, the directions of the relationships were all quite similar to national patterns discussed in the literature section of this paper. As age increased, so did the extent of use for both drugs. Females tended to use both drugs less frequently than males. Students with married parents who had good interpersonal associations tended to be less frequent users of both drugs.

The only correlation of any substantive meaning in the correlation matrix is between the frequency of alcohol and frequency of marijuana use. The correlation is moderately high (0.55) and positive, which means that students who are frequent users of alcohol are also frequent users of marijuana. This finding is quite consistent with other research efforts designed to assess multiple drug use involving alcohol, marijuana and other drugs (Josephson, 1974:197; Single, et al, 1974; Patch, 1973:977; McGlothlin, 1974:288-289; Groves, 1974:359; Ellinwood, 1974; National Commission on Marijuana and Drug Abuse, 1972: 32-33, 45-46; National Commission on Marijuana and Drug Abuse, 1973: 70-71, 92-93).

Regression Analyses

The data were subjected to step-wise regression analyses and the findings are presented in standardized regression coefficient form in Tables 3 and 4.

Table 3: Step-Wise Regression Analysis for Alcohol Use and Selected Independent Variables Presented in Standardized Regression Coefficient Form (N = 492)

Step Number	Independent Variables							Adjusted Coefficient of Determination	F-Ratio of Entering Variable
	Age	Personal Crisis	Parental Association	Sex	Academic Performance	Parents' Marital Status	Income		
Step 1	0.254	--	--	--	--	--	--	0.063	33.8
Step 2	0.245	-0.208	--	--	--	--	--	0.104	23.7
Step 3	0.239	-0.191	-0.134	--	--	--	--	0.120	9.9
Step 4	0.239	-0.181	-0.138	-0.094	--	--	--	0.127	4.9
Step 5	0.251	-0.172	-0.133	-0.088	-0.079	--	--	0.131	3.3*
Step 6	0.252	-0.168	-0.127	-0.084	-0.076	-0.057	--	0.132	1.8*
Step 7	0.252	-0.168	-0.128	-0.085	-0.077	-0.058	0.012	0.130	0.1*

*Not significant at the .05 level.

Table 4: Step-Wise Regression Analysis for Marijuana Use and Selected Independent Variables Presented in Standardized Regression Ceofficient Form (N=492)

Step Number	Independent Variables							Adjusted Coefficient of Determination	F-Ratio of Entering Variable
	Personal Crisis	Age	Parents' Marital Status	Parental Association	Sex	Academic Performance	Income		
Step 1	-0.194	--	--	--	--	--	--	0.036	19.2
Step 2	-0.186	0.183	--	--	--	--	--	0.067	17.5
Step 3	-0.173	0.185	-0.135	--	--	--	--	0.083	9.7
Step 4	-0.161	0.181	-0.125	-0.101	--	--	--	0.092	5.4
Step 5	-0.153	0.181	-0.118	-0.105	-0.084	--	--	0.097	3.8*
Step 6	-0.147	0.188	-0.116	-0.102	-0.081	-0.052	--	0.097	1.4*
Step 7	-0.148	0.189	-0,119	-0.104	-0.082	-0.053	-0.021	0.096	0.2*

*Not significant at the .05 level.

(Tables 3 and 4 Here)

The regression findings presented in Tables 3 and 4 indicate that the independent variables considered simultaneously explained a very small portion of the variability in frequency of marijuana and alcohol use. Four variables were shown to explain 12.7 percent of the variance in alcohol use. Those factors are: age, personal crisis, parental association, and sex. The best regression model for alcohol use is presented in standardized coefficient form below.

$$y = 0.239\,x_1 - 0.181\,x_2 - 0.138\,x_3 - 0.094\,x_4 + 0.934\,e$$

where y = frequency of alcohol consumption

x_1 = age

x_2 = personal crisis

x_3 = parental association

x_4 = sex

e = residual error.

The findings presented in Table 4 show that four variables explain 9.2 percent of the variance in frequency of marijuana use. Three of the four independent variables are the same variables which were significant in explaining the variance in frequency of alcohol consumption. The four variables significant in explaining the variance in frequency of marijuana use are: personal crisis, age, parents' marital status, and parental association. The best regression model for frequency of marijuana use is presented below in standardized regression coefficient form.

$$y = -0.161\,x_1 + 0.181\,x_2 - 0.125\,x_3 - 0.101\,x_4 + 0.953\,e$$

where x_1 = personal crisis

x_2 = age

x_3 = parents' marital status

x_4 = parental association

e = residual error.

CONCLUSIONS

The study findings demonstrated that the extent of alcohol and marijuana use among the study participants was very high. This was quite surprising since previously conducted research in nonmetropolitan areas of the U.S. indicate that the incidence of alcohol and marijuana use has traditionally been quite small relative to metropolitan areas (Bowker, 1976; National Commission on Marijuana and Drug Abuse, 1973; Forslund, 1977-78; Heiligman, 1973; Tolone and Dermott, 1975; Fischler, 1975-76). The data presented in this paper clearly show that alcohol and marijuana use by juveniles is not confined to cities and suburbs but is identifiable in rural farming areas as well. This finding suggests that rural residence is no longer a safeguard (if it ever was) against deviant behavior in the form of alcohol and marijuana abuse by rural youth.

The multi-variate analyses demonstrated that the established alcohol and marijuana use patterns for juveniles presented in this literature were also present in the rural study group. The amount of explained variance for the two variables, however, indicates that the explanation of alcohol and marijuana use in rural areas is much more complex than existing models are able to accommodate. All of the variables included in the study were related in one form or another to individual or family characteristics. Structural factors such as the diversity of the region's economic system,

potential for social mobility, and ability of the individual to strongly influence his/her destiny should be considered as potential explanatory variables. The influence of peer groups should also be investigated since peers often affect much of our behavior.

An interesting finding is the relatively high correlation between frequency of alcohol and marijuana use. This finding indicates that users of one substance have a relatively high probability of using the other. This pattern has also been noted in other drug abuse studies. One means of determining who will have the highest probability of being marijuana users among the study population is to determine who consumes alcohol. Since the social stigma attached to alcohol use is not great, it should be possible to ascertain alcohol consumption rates which makes it possible to identify those who are most likely to be marijuana users. Once this has been accomplished, programs designed to reduce the use of marijuana may be focused upon the individuals who have the highest probability of being offenders.

In summary, socio-demographic and family characteristics such as those used in this study were shown to have only limited utility for understanding the incidence of alcohol and marijuana abuse. If the phenomenon of rural drug use is to be understood, then more comprehensive explanatory models must be developed. Reliance upon existing models to explain alcohol and marijuana use without significant modification is probably not very fruitful. The study data strongly suggest that social scientists can no longer ignore rural drug abuse. It is highly probable that drug abuse among rural youth is pervasive throughout the society.

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